

## EXPERIMENT

## VEGETABLE PEOPLE

### AIM

To model inheritance by building vegetable people.

### MATERIALS

- potato
- sultanas
- celery sticks—long and short
- carrot slices
- toothpicks
- onion
- peas (fresh)
- parsnip slices

### METHOD

1 There are two sexes of vegetable people—potato and onion—and each has body parts with appearances (phenotypes) which are expressions of dominant or recessive genes. Table 4.3 is a summary of the gene combinations (genotypes) of the body parts and the phenotypes they produce.

**TABLE 4.3**  
Phenotypes and genotypes of vegetable people.

Characteristic	Phenotype	Genotype	Responsible genes
eyes	sultana	BB or Bb	B (dominant)
	pea	bb	b (recessive)
arms	long celery stick	LL or Ll	L (dominant)
	short celery stick	ll	l (recessive)
feet	carrot slices	CC or Cc	C (dominant)
	parsnip slices	cc	c (recessive)

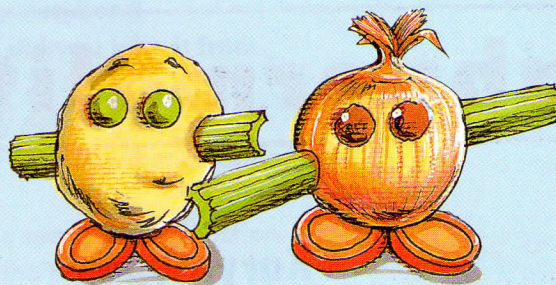
Table 4.4 shows the genotype of Ma Potato and Pa Onion.

**TABLE 4.4**

Parent	Sex chromosomes	Eye genes	Arm genes	Feet genes
Ma Potato	XX	bb	ll	Cc
Pa Onion	XY	Bb	Ll	Cc

In your workbook write out Table 4.4 and for each genotype add the phenotype for the characteristic.

2 On small pieces of paper write each sex chromosome and gene for Ma Potato and Pa Onion's characteristics. This should give you 4 'gene' piles each for Ma and Pa.



**FIGURE 4.25**

3 Randomly select one sex chromosome and then one of each gene from Ma's four piles of genes then do the same for Pa's genes. These are the genes of your vegetable child. Write out the genotype and phenotype of your vegetable child.

4 Construct your vegetable child using the materials provided.

5 Look at the vegetable children made by other members of the class and record the phenotype and genotype of at least four different examples.

6 All groups should now contribute to a set of class results. Each group should randomly select a pair of sex chromosomes from their two gene piles to determine the frequency of occurrence of potato and onion children. Then do the same for each of the other characteristics, remembering there are three possible genotypes for each. Record these in a table.

### DISCUSSION

1 What is the probability of a vegetable child being a potato or an onion? Compare this with the results of the class random selection.

2 Draw a punnet square to determine the probability of each genotype for the three characteristics. Compare this with the results of your class random selection.

### EXTENSION

If you wanted to select genes for a second and a third vegetable child, would you need to do anything to your gene piles? Explain.

that prevents the affected person's blood from clotting. Generally, only males can have haemophilia, because

female foetuses with haemophilia will abort naturally before birth. Explain why you think this might be the case.